

Sustainable Aviation Resource Guide

Presented by: Gene Peters March 10, 2010

35th Annual FAA Aviation Forecast Conference Washington, DC

What is SAGA?

SAGA = the Sustainable Aviation Guidance Alliance

"a broad volunteer coalition of aviation interests formed in 2008 to assist airport operators of all sizes in planning, implementing, and maintaining a sustainability program."

www.airportsustainability.org



Purpose of SAGA

- Guides airports on how to start a sustainability program
- Compiles airport-specific sustainability practices in a searchable database (in Excel & Web-based database)
- Suggests methods to adapt practices to airports of all sizes & types
- Provides specific references to airports' source documents



Roof-Mounted Solar PV System on Terminal 3 at San Francisco International Airport

SAGA Participants

- Airports Council International-NA (ACI-NA)
- Airport Consultants Council (ACC)





- American Assoc. of Airport Executives (AAAE)
- Air Transport Association (ATA)





Federal Aviation Administration (FAA)





















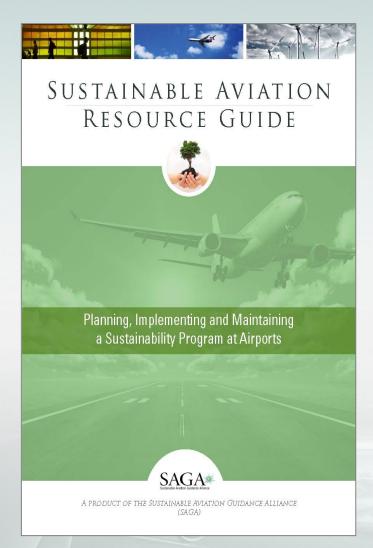




SAGA Participants

- Jessica Steinhilber and Paul Eubanks (ACI-NA)
- T.J. Schulz (ACC)
- Leslie Riegle and Melissa Sabatine (AAAE)
- Dean Schultz (RNO; AAAE Environmental Chair) and Todd Welty
- Tim Pohle and Kevin Welsh (ATA)
- Julie Barrow (FAA)
- Katie Choe (BOS)
- Rosie Andolino (ORD/OMP)
- Roger Johnson and Intissar Durham (LAWA)
- Burr Stewart (Port of Seattle; TRB Sustainability Subcommittee Chair)
- Gene Peters (Ricondo & Associates, ACI Sustainability Subcommittee)
- Kristin Lemaster (CDM; AAAE Sustainability Issue Tracker)
- Carol Lurie (VHB; ACC Board member)
- Eric Dillinger (Jacobs Consultancy)
- Mary Vigilante (Synergy Consultants)

Sustainable Aviation Resource Guide



- Section 1 Introduction
- Section 2 How to Start, Implement,
 Sustain and Maintain a Program
- Section 3 Sustainability Program Examples
- Section 4 Sustainability Database

Section 1 – Introduction

- Overview of Sustainability at Airports
- Why Airports Undertake Sustainability Initiatives
- Benefits of a Sustainability Program

SAGA Does Not Supersede Other Standards
Such as LEED® but Augments Other Resources

Section 1 – Introduction

- Range of Options for Defining Sustainability:
 - Brundtland Commission (1983) "..development that meets the needs of the present without compromising the ability of future generations to meet their own needs."
 - Airport Cooperative Research Program (ACRP) S02-02 "a broad term that encompasses a wide variety of practices applicable to the management of airports." Practices that ensure:
 - Protection of the environment, including conservation of natural resources
 - Social progress that recognizes the needs of all stakeholders
 - Maintenance of high and stable levels of economic growth and employment
 - "Triple Bottom Line" Economic Growth, Social Responsibility and Environmental Stewardship
 - ACI-NA "...a holistic approach to managing an airport so as to ensure the integrity of the Economic viability, Operational efficiency, Natural Resource Conservation and Social responsibility (EONS) of the airport"

Section 2 – Planning, Implementing, Improving, and/or Maintaining a Sustainability Program

- Establish Vision and Strategic Goals
- Conduct Assessment
- Identify & Rank Opportunities
- Refine Goals
- Select Actions & Set Targets
- Develop Action & Monitoring Plans
- Implement Initiatives
- Monitor Performance
- Communicate Progress

Section 3 – Sustainability Program Examples

- Demonstrates how an airport can execute the steps of the management system approach to sustainability outlined Section 2
 - Example 1 Pilot Recycling Program
 - Example 2 Comprehensive Sustainability Program







Scalable for all sizes of Airports

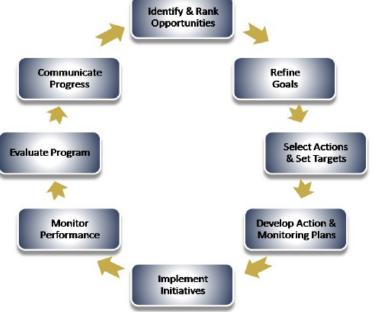


Figure 2-2. Steps for a management system approach to sustainability

Section 4 – Sustainability Database

- Sources of Sustainable Practices from:
 - Sustainable Aviation Guidelines
 - Professional Organizations, including: ACI, USGBC, ACRP
 - Industry Experts
 - Leading Airports



LEGEND/SOURCES O'Hare International Airport (OPD) Sustainable Design M

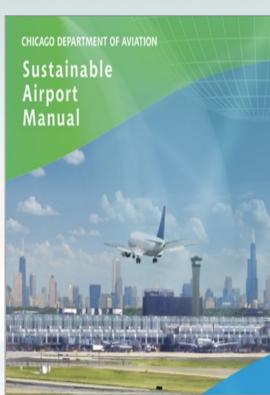
- = O'Hare International Airport (ORD) Sustainable Design Manual Initiative
- = Chicago Department of Aviation Sustainable Airport Manual (SAM) 2009
- = Los Angeles World Airports (LAWA) Sustainable Design, Planning & Construction Guidelines
- = Ricondo & Associates / Airports Council International Draft Sustainability Index
- = Boston-Logan International Airport (BOS) and/or Philadelphia International Airport (PHL) Initiative
- = San Francisco International Airport (SFO) Initiative
- = Seattle-Tacoma International Airport (SEA) Initiative
- = Denver International Airport (DIA) Initiative
- = Albany International Airport (ALB) Initiative
- = Leadership in Energy and Environmental Design (LEED) for New Construction V2.2 Initiative
- = Vancouver International Airport (YVR) Initiative
- = New Chitose Airport (CTS) (Hokkaido, Japan) Initiative
- = ACRP Synthesis 10: Airport Sustainability Practices
- = Field Guide for Sustainable Construction (2004), Pentagon Renovation and Construction Program Office & Pennsylvania

- Over 100 Sustainability Resources from Around the World:
 - Airport Sustainability Guidelines
 - Airport Sustainability Policies, Plans & Reports
 - LEED Reference Guides & Materials
 - Literature from Research Institutions
 - Sustainable Construction Guidelines
 - Trade Association Documents
 - Transportation Research Board
 - Airport News Publications
 - Websites
 - Conferences









- Consolidated list of Sustainable Aviation Practices
 - 972 Practices (as of September 2009)
 - 68 Column Categories/Searchable Criteria
- Searchable
 - Can be tailored to the unique requirements of an individual airport
 - Available as an Excel Spreadsheet or Web Based Database (<u>www.airportsustainability.org</u>)

- Organized by a Broad Range of Criteria:
 - Activities
 - Planning & Design
 - Construction Activity
 - Day to Day Airport Operations
 - Maintenance
 - Administration & Finance
 - Community & Public Relations

- EONS
 - Economic Viability
 - Operational Efficiency
 - Natural Resources
 Conservation
 - Social Responsibility

- Functional Areas
 - Landside
 - Airside

- 68 Column Categories:
 - LEED

 → Potential Applicability to LEED Credits
 - Activity (6 Columns) ⇒ Construction Activity, Day to Day Operations, Administration, etc.
 - Functional Area (30)
 - Landside ⇒ Tenants/Concessions, Vehicle Maintenance & Fueling Facilities, Roadways, etc.
 - EONS (31) ⇒ Economic Viability, Operational Efficiency, Natural Resources Conservation, Social Responsibility

								Terminal Buildings and Interior Are					
	Practice	Potential LEED Applicability	Planning & Design	Construction Activity	Day to Day Airport Operations	6 Maintenance	8 Org	aniza Community & Public Relations	Terminal Buildings & Concourses	Colu Gate Areas & Passenger Handling	mn Offices	Tenants I	Baggage Handling
666	Install Kevlar bird deterrent wires or other mechanisms to prevent waterfowl from using area water bodies.	,,,,,,,,,,,	v		4								
667	Develop and implement an Integrated Pest Management plan (IPM).		*		✓	✓	✓						
	Materials and Resources												
	Waste Reduction												
668	Include educational training on waste reduction for the project team as part of the initial sustainability project planning meeting.		v	~	*	*	*						
669	Participate in a "waste-to-profit" network to identify by-product synergy and material reuse opportunities. The city or state network may (or could) include participants from area companies, institutions, and city or state departments (see www.wastetoprofit.com/).			*	~	~	*	,				~	
670	Develop and utilize an off-airport composting facility.		· /		✓	✓	✓	✓	V			✓	
671	Separate food waste from normal waste to utilize for composting (off-site only), biofuels, livestock feed, and other uses.		*		1	~	~	~	*			~	
672	Develop and implement public food waste collection stations.		v		v	✓	~	*	✓			~	
673	Develop and implement a surplus food program to benefit area food banks by supplying pre-packaged sandwiches, salads, pastries, muffins, cookies, etc.		*		1	*	~	*	*			*	



Sample of EONS Categories (31 total)

	0	peration	al Efficiend	у		Natural Resources Conservation					
Reduces Roadway Congestion	Improves Intermodal Transportation Access	Air Travel Delay Reduction	Customer Service Improvement	APUs, Gates, GSE Equipment Improvements	Conserves Energy	Benefits Air Quality & Climate Change I Reduces Greenhouse Gasses	Noise Abatement	Water Quality Protection &	Wildlife Management <i>i</i> Reduces Wildlife Hazards	Landscape / Vegetation Management	Reduces Solid Waste / Enhances Recycling
		·		· /			· /				



ULSD Fuel Construction Vehicles



Preconditioned Air At Gates



Increased Towing

Economic Viability					Social Responsibility							
High First Cost	Life Cycle Cost Benefits	Requires Staff Training	Through Stand-	FAA Funding Eligible as Part of Larger Projects / Through Design Considerations	Generates Revenue	Enhances Employee Welfare	Facilitates Diversity / Environmental Justice	Facilitates Education & Public Outreach	Public Relations Opportunity	Innovative / Aviation Industry Leading	Enables Transparency / Facilitates Information Sharing	Results in Regional Economic Benefit
	1	-/						-/	-/		-/	

- Database Considerations:
 - A broad listing of practices not particular to one definition of sustainability
 - The airport/contractor must determine what practices abide by their particular definition
 - Each practice serves as a starting point for additional research & consideration
 - Some practices include web references or applicable guidance manuals/reports
 - Applicable to all airport sizes, traffic levels, and locations
 - The user must determine what practices are the most feasible and beneficial to their particular airport's objectives and budget

Example (1) of SAGA Database Use

- An airport is interested in sustainable practices that conserve energy in its terminal buildings and concourses, have life cycle cost benefits, but do not require staff training
- A search could be conducted using the following criteria/column headings:
 - Day to Day Airport Operations (Activity)
 - Terminal Buildings and Concourses (Functional Area Landside)
 - Life Cycle Cost Benefits (EONS Economic Viability)
 - <u>DOES NOT</u> Require Staff Training (EONS Economic Viability (blanks selected))
 - Conserves Energy (EONS Operational Efficiency)

Example (1) of SAGA Database Use

The Database reveals 32 applicable sustainable practices, including:



Install occupancy sensors, either infrared (heat detection), ultrasonic (movement detection), or a combination of both, to control lighting in areas that are intermittently occupied (e.g., rest rooms, storage areas, stairwells, etc.).

Turn off computer monitors if they are not going to be used for more than 20 minutes (a small surge in energy occurs when a monitor starts up; see www.energysavers.gov/your_home/appliances/index.cfm/mytopic=10070).

Require the use of (or provide incentives for) centralized pre-conditioned air (PCA) and ground power systems (400 Hz) for gated aircraft. For all new terminal leases, establish lease provisions that require PCA units at all gates with 400 Hz power.

Meet or provide lower light levels & uniformity ratios than those recommended by the Illuminating Engineering Society of North America Recommended Practice Manual: Lighting for Exterior Environments.

Where acceptable, use High Pressure Sodium (HPS) lamps instead of Metal Halide (MH) lamps; HPS Lamps produce more lumens per watt, have less mercury content per lamp, and have a greater average rated life expectancy than MH lamps.



Example (2) of SAGA Database Use

- An airport wants to encourage its tenants to implement sustainable practices to reduce waste & improve public opinion
- The airport would search based on the following criteria:
 - Tenants & Concessions (Functional Area Landside)
 - Reduce Solid Waste/Enhances Recycling (EONS Natural Resource Conservation)
 - Public Relations Opportunity (EONS Social Responsibility)





Example (2) of SAGA Database Use

The Database would reveal 50 applicable practices, including:

Donate airplane passenger headphones, blankets and pillows to homeless shelters and/or charity organizations such as the Ronald McDonald House.



Develop and implement a surplus food program to benefit area food banks by supplying pre-packaged sandwiches, salads, pastries, muffins, cookies, etc.

Set up annual or bi-annual clean-up events that allow tenants, airlines, and airport employees to dispose of bulky, non-hazardous items. The materials are then deconstructed for recycling, donated, or disposed.

Use biodegradable plates and cutlery made from corn and wheat starch.



Develop and implement a 'Periodicals for Education' program, collecting magazines, newspapers, and books from international passengers and donating them to educational facilities that teach foreign languages, senior centers, and/or united service organizations.

Port of Portland, Lufthansa Airlines, & Evergreen Eagle Initiative

Sustainability Database – Innovative Examples

Unique practices included in the Database
Can you guess the airport that implements the innovative practice?

A. #435: Use collected snow to chill the liquid used in the airport's cooling

system in the summer.



A. New Chitose Airport, Hokkaido, Japan

B. #661: Control invasive species, noxious weeds, and keep vegetation low by using local farm animals such as goats and cattle as well as other biological means such as beetles.

B. San Francisco International Airport



Sustainability Database – Innovative Examples

C. #689: Use recycled coffee grounds for ant control. (Flower, chili powder, cinnamon, peppermint, and/or black pepper can also be used.)

C. Charlotte-Douglas International Airport





- D. #696: Implement a toilet paper roll repurposing (re-rolling) program. The re-rolled toilet paper is reused at the airport or sent to local homeless shelters.
 - D. Denver International Airport

Sustainability Database - Innovative Examples

- E. #731: Provide liquid collection stations, especially at security checkpoints where full beverage bottles and other liquids are disposed of, to minimize landfill bound waste and janitorial staffing costs. The liquid collection stations are designed to be easily rolled to a mop sink or drain.
 - E. Portland International Airport
- F. #687: Recycle used restaurant grease to manufacture biofuel.

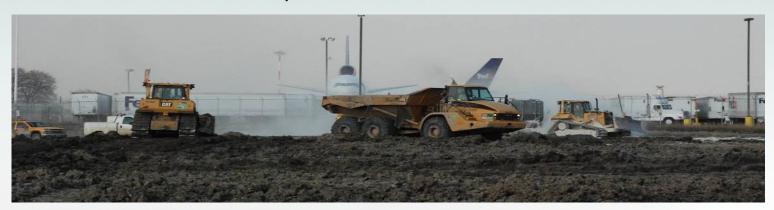


F. Seattle-Tacoma International Airport



Sustainability Database – Innovative Examples

G. #863: Develop a Tier compliant and retrofit program for construction vehicles (e.g., retrofit all pre-Tier, Tier 1 and Tier 2 construction vehicles).



Chicago O'Hare International Airport



H. #300: Utilize warm-mix asphalt to reduce energy needs during construction.

Boston-Logan International Airport
Outer Edges of Runway 4R/22L

Sustainability Database – Innovative Examples

I. #453: Utilize wind power.

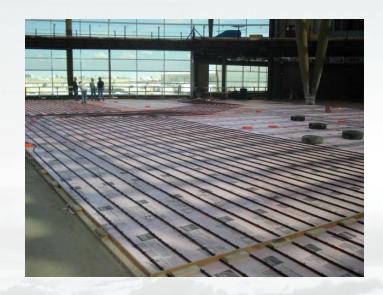


Minneapolis St. Paul International Airport

K. #238: Utilize stormwater cisterns for capturing rainwater from roofs for irrigation.



J. #402: Install a radiant floor system to provide both heating and cooling to the space, working in conjunction with a forced-air system.

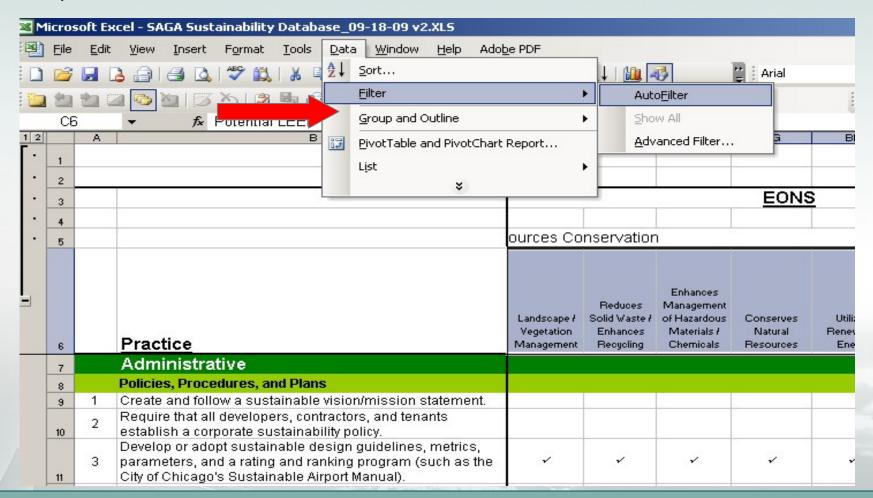


Indianapolis International Airport

Atlanta Hartsfield-Jackson International Airport

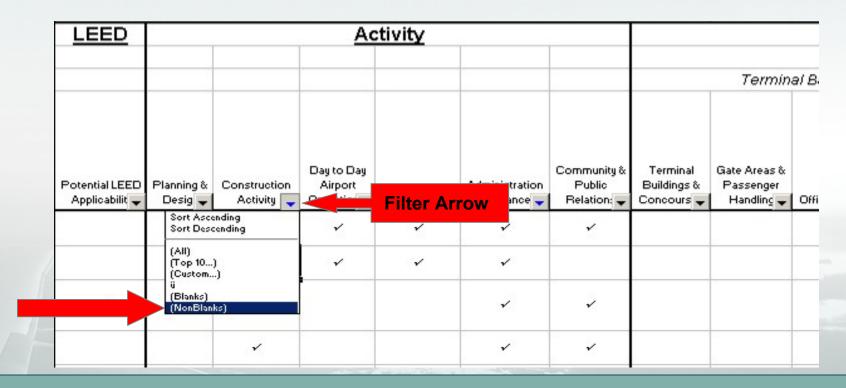
Excel Database Filter Search

 If in Microsoft Excel, the user would highlight all column headings (Row #6) and select DATA → FILTER → AUTO FILTER

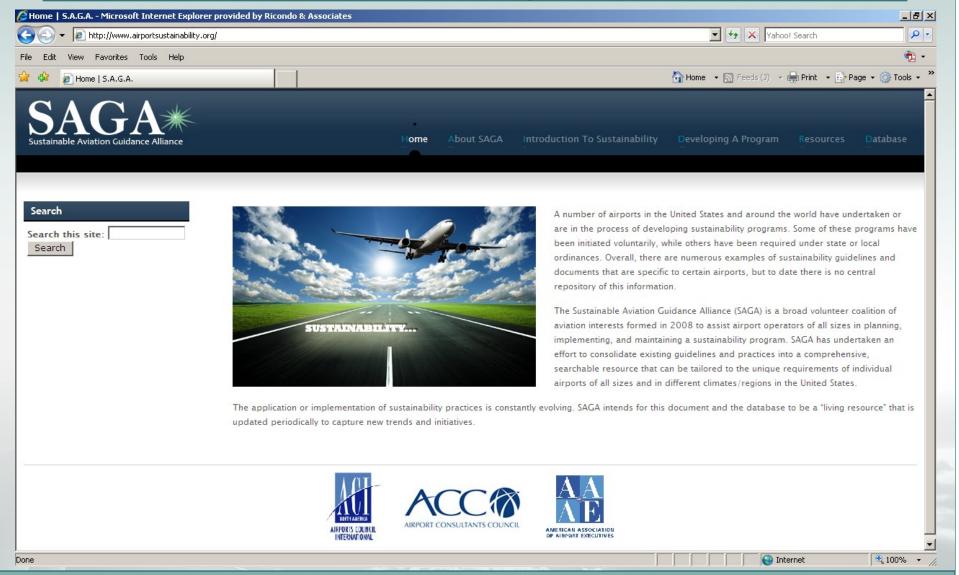


Excel Database Filter Search

- The user (if in Excel) would select the filter arrow, revealing different options of how to organize the data
- The user could select "Blanks" or "Non Blanks" for any columns/criteria:
 - "Non Blanks" = Practices that fit the criterion (with ✓)
 - "Blanks" = Practices that do not fit, or are the opposite of, the criterion (without ✓)



SAGA Website Home Page



Website Database

- Presented in 3 Formats:
 - 1. Summary of Sustainability Practices
 - 2. Sustainability Practices & Relationships to Activity, Functional Areas & EONS
 - 3. Sustainability Practices in Excel Format
- Searchable using same 68 columns via drop down boxes or by keyword



www.airportsustainability.org:8080/SAGALinks/mainmenu.aspx

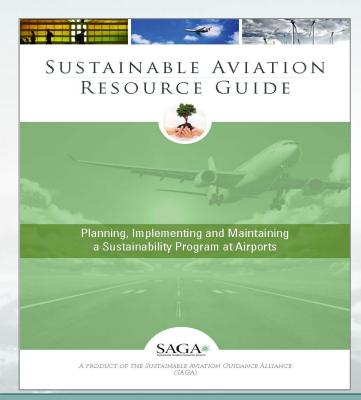
Website Database

	SAG Sustainable Aviation Gui		н	ARRONE CON	Compatible with Nearby Land Uses Conserves Energy Conserves Natural Resources Customer Service Improvement Enables Transparency / Facilitates Information S Enhances Employee Welfare
	Version: 10/09/09	SAGA Sustainabilit <u>Main</u>	y Program <u>Menu</u>	ı database	Enhances Management of Hazardous Materials / FAA Funding Eligible as Part of Larger Projects / FAA Funding Eligible Through Stand-Alone Proje Generates Revenue
Practice Listing					High First Cost Improves Intermodal Transportation Access Improves Quality of Life (e.g., Noise, Stormwater
Practice Category:	All	▼	Sub Ca	tegory	Innovative / Aviation Industry Leading Life Cycle Cost Benefits
Activity	.All		EON	NS	Noise Abatement Benefits
Functional Area	.All	v	Contains Keyword		Promotes Diversity / Environmental Justice Promotes Landscape / Vegetation Management Public Relations Opportunity
Find Practices					Reduces Roadway Congestion Reduces Solid Waste / Enhances Recycling
					Requires Staff Training Results in Regional Economic Benefit Utilizes Renewable Energy
	Practice	Category			Water Quality Protection & Conservation
footcandles (excluding all direct s regularly occupied areas. (Space	s excluded from these requirements as, mechanical plant rooms, laundry	Indoor Environmental Quality	Day	light and Views	Wildlife Management / Reduces Wildlife Hazards
90% of all regularly occupied spa	on glazing for building occupants in ices. (Spaces excluded from these s, storage areas, mechanical plant cupancy support areas).	Indoor Environmental Quality	Day	light and Views	search box
Acquire manufacturer documenta projected results, and in-situ perf standard performance results.	tion and guarantee of installations, ormance criteria to compare to	Energy Efficiency and Atmosph	ere Syst	tems Commissionin	9

Format 1: Summary of Sustainability Practices

SAGA Achievements

- Working Group Formed Fall 2008
 - Formulated Goals, Developed Approach, Identified Products, Assigned Responsibilities
- Obtained Peer Review Group Input Summer 2009
 - 100+ Sustainability Professionals
 - 55 Pages of Comments on Initial Draft
- Published Guidebook Fall 2009
 www.airportsustainability.org/resources
- Published Database Fall 2009



Next Steps – The "SAGA" Continues...

- Identify Additional Sustainable Practices (ongoing)
- Obtain Feedback From Users
 - Expanded vs. Simplified Practices (quantity vs. quality)
 - Additional Columns/Searchable Criteria
 - Methods to Improve Organization & Use
 - Review Over 65,000 Evaluations
 - Enhanced Excel Database and/or Website
- How to Maintain Database
 - Living Document
 - New & Continually Evolving Practices
- Industry Conferences
- Explore Continuing SAGA Using the ACRP Process



On-Airport 100 ft. Wind Turbine at Burlington (VT) International Airport

National Attention and Industry Recognition



MARKETING DEPARTMENT OH BEHALF OF TODAY'S NEWS

USA TODAY is proud to be a member of Airport Council International

Monday, October 12, 2009

Newsline

Monday, October 12, 2009

07:30 am - 10:00 am Exhibition Hall Open

Tuesday, October 13, 2009

Wednesday, October 14, 2009

08:30 am - 10:00 am 7. Airport Forum with the FAA

SAGA develops sustainability database

Bergen to present keynote address at

ACI-NA Annual Conference & Exhibition

Another year, another great conference

Welcome to Austin!



Farewell with flair

RS&H: Improving your world

RS-H







Questions?

Gene Peters, Ricondo & Associates, Inc. epeters@ricondo.com 773-462-7333



- Jessica Steinhilber, ACI-NA
- Leslie Riegle, AAAE
- T.J. Schulz, ACC

jsteinhilber@aci-na.org leslie.riegle@aaae.org tjs@ACConline.org

